COURSE OUTLINE OF RECORD

Number: GEOL G120  
TITLE: Historical Geology

ORIGINATOR: Bud Benneman  
EFF TERM: Fall 2018

FORMERLY KNOWN AS:  
DATE OF OUTLINE/REVIEW: 03-20-2018

CROSS LISTED COURSE:  
TOP NO: 1914.00

CID: GEOL 111

SEMESTER UNITS: 4.0  
HRS LEC: 54.0  
HRS LAB: 54.0  
HRS OTHER: 0.0

CONTACT HRS TOTAL: 108.0

STUDY NON-CONTACT HRS RECOMMENDED: 108.0

CATALOG DESCRIPTION:
An introduction to the development of the Earth through time. This course utilizes the scientific method to understand the geologic evolution of land forms such as mountains, oceans, canyons, faults and the tectonic development of the Earth. This course examines how tectonic activity shaped landscapes, climate and the development of life, which started in the ocean and evolved onto land. The geologic time scale is used to understand plant and animal evolution, extinctions and how modern plant and animal forms developed.

JUSTIFICATION FOR COURSE:

PREREQUISITES:

COREQUISITES:

ADVISORIES:

ASSIGNED DISCIPLINES:
Earth science

MATERIAL FEE: Yes [ ] No [X] Amount: $0.00

CREDIT STATUS: Noncredit [ ] Credit - Degree Applicable [X] Credit - Not Degree Applicable [ ]

GRADING POLICY: Pass/No Pass [ ] Standard Letter [X] Not Graded [ ] Satisfactory Progress [ ]

OPEN ENTRY/OPEN EXIT: Yes [ ] No [X]

TRANSFER STATUS: CSU Transferable[ ] UC/CSU Transferable[X] Not Transferable[ ]

BASIC SKILLS STATUS: Yes [ ] No [X]  
LEVELS BELOW TRANSFER: Not Applicable

CALIFORNIA CLASSIFICATION CODES: Y - Not Applicable

NON CREDIT COURSE CATEGORY: Y - Not applicable, Credit Course

OCCUPATIONAL (SAM) CODE:

REPEATABLE ACCORDING TO STATE GUIDELINES: No [X] Yes [ ] NUMBER REPEATS:

REQUIRED FOR DEGREE OR CERTIFICATE: No [ ] Yes [X]

Geology(Associate in Science for Transfer)

GE AND TRANSFER REQUIREMENTS MET:

IGETC Area 5: Physical and Biological Sciences
   5A: Physical Science
   5C: Laboratory Activity

CSU GE Area B: Scientific Inquiry and Quantitative Reasoning
   B1 - Physical Science
   B3 - Laboratory Sciences
Degree Applicable
AS-T Degree Applicable

COURSE LEVEL STUDENT LEARNING OUTCOME(S) Supported by this course:

1. Illustrate the evolution of the Earth over geologic time with respect to the development of life, ecological development, the fossil record and the impact plate tectonics had on past climates and life forms.
2. Employ the scientific method from a theoretic prospective from lecture material and in an applied aspect from laboratory experiments.
3. Illustrate the formation of continents, mountain ranges, ocean basins and the geomorphology of fluvial, glacial, eolian process on land.
4. Discuss the impacts of the San Andreas Fault on extension tectonics, and the development of the Basin and Range and the current California coastal topography and the formation of various mineral resources along with fossil fuels.
5. Relate paleoclimatology, paleo geographic reconstruction and mass extinctions to tectonic settings, geography and ecological environments throughout the history of the Earth.

COURSE OBJECTIVES:

1. Use the scientific method to explain the physical and ecological development of the Earth over geologic time.
2. Utilize the fossil record to recognize the major geologic time divisions with respect to plant and animal fauna, ecology, biological evolution, mass extinctions, the environmental and structural-geological conditions of the period.
3. Explore the various land forms and the physical development of oceans, mountain ranges, canyons, faults and glaciers.
4. Explore the geological development of the western North American Continent and the evolution of the California landscape and development of the modern coast.

COURSE CONTENT:

LECTURE CONTENT:

A. Planet Earth as an evolving system.
   1. The scientific method
   2. Origin of the universe
   3. Development of the Earth
      a. Important mineral compounds
      b. Igneous, sedimentary and metamorphic rocks
   4. Plate tectonics
      a. Supercontinent snow ball Earth
      b. Plate boundaries
      c. Volcanoes and mountain building
      d. Ocean basin formation
B. Basic elements and compounds.
   1. Naturally occurring elements and compounds.
   2. Mineral groups
   3. Rocks
      a. Igneous
      b. Sedimentary
      c. Metamorphic
   4. The environments and the processes responsible for rock and mineral formation.
5. Sedimentary environments and the formation of the fossil record.
6. Stratigraphy and geologic units.
C. Fossils and the fossil record over geologic time.
1. Paleographic reconstruction
2. Biological Evolution
3. Paleoclimatology
4. Mass extinction events
5. Evolution of life
6. Geologic time divisions based on life forms and tectonic events.
   a. Absolute and relative dating
   b. Haden Eon
   c. Archean Eon
   d. Proterozoic Eon
   e. Phanerozoic Eon
   f. Pre-Cambrian life forms
   g. Pre-Cambrian/Cambrian boundary
   h. Paleozoic
      i. Mesozoic
      j. Cenozoic
D. Development of Landscapes and Land Forms.
1. Fluvial systems
2. Carst Topography
3. Eolian Landscapes
4. Glaciation
5. Structural features (faults, folds)
6. Erosional unconformities
E. Internal Crustal Processes
1. Mineral and rock formation
2. Convection Currents
3. Hot Spots

LABORATORY CONTENT:

A. Geologic Time scale
1. Geologic time Eons, Eras and Periods each division of time will be based on life forms and tectonic events.
   a. Haden Eon
   b. Archean Eon
   c. Proterozoic Eon
   d. Phanerozoic Eon
   e. Pre-Cambrian life forms
   f. Pre-Cambrian/Cambrian boundary
   g. Paleozoic
   h. Mesozoic
   i. Cenozoic
B. Evolution of life and the fossil record
1. Pre-Cambrian and the Cambrian.
   a. single cell and multiple cell organisms
   b. Blue-Green and Red Algae
2. The Paleozoic life explosion
   a. Life in the early oceans
b. Life transition from the ocean to land
c. Terrestrial Plants
d. The Carboniferous
e. Fossil Evolution-Succession
f. Mass extinction events of the Paleozoic
g. Dating methods
3. Mesozoic life and a tropical Earth.
   a. Dinosaurs
   b. Amphibians and Reptiles
   c. Birds
   d. Mass extinction volcanic-impact theory
4. Cenozoic
   a. Mammals, birds and grasslands
   b. Humans
   c. Ice ages and the Holocene
d. Species extinctions
5. Fossil Identification.
   a. linking past organisms with current life forms
   b. Index fossils
   c. Modes of fossil preservation
d. Extinction in the fossil record
e. Biological evolution
f. Fossil succession
g. Ecology and paleoecology
6. Classification of fossils taxonomy
   a. Domain
   b. Kingdom
c. Phylum
d. Class
e. Order
f. family
h. Genus
i. Species
C. The historical significance of sedimentary rocks.
1. The sedimentary rock record.
   a. Fossil occurrences in sedimentary rock types.
2. Paleo- Environmental conditions
   a. Limestone formation
   b. Shale deposits
   c. Sandstone formation
d. Tar and Oil
3. Geologic maps and stratigraphy and cross sections.
   a. Absolute and relative dating
   b. Structural features
c. Construction and interpretation of cladograms
d. Age and correlation to other formations and stratigraphic cross sections
e. Interpreting sequences of geologic events
4. Identification of important mineral deposits
   a. Banded iron formations
   b. Mineral oxidation reduction formation
5. Identification of igneous, sedimentary and metamorphic rocks
   a. Relate rocks to the tectonic settings
b. Rocks as paleo environmental identifiers  
c. Geologic-historical attributes of rocks 
6. Field trips during lab time.  
a. Explore current and past ecology  
b. Use geologic and topographic maps  
c. Relate current topography to Plate Tectonics.  
d. Construct a cross section.  
e. Interpret rock formations

METHODS OF INSTRUCTION:
A. Lecture:  
B. Lab:  
C. Field Experience:  
D. Independent Study:

INSTRUCTIONAL TECHNIQUES:
A. Lecture  
B. Lab employing lecture topics  
C. Demonstrations in lecture and lab  
D. Group lab projects  
E. Student and group presentations  
F. Report writing  
G. Poster projects  
H. Internet projects  
I. Lecture and lab evaluations  
J. Field trips

COURSE ASSIGNMENTS:  
Reading Assignments  
A. Text chapter reading  
B. Online power point and podcast  
C. Pre lab assignments
   
Out-of-class Assignments  
A. Internet assignments  
B. Poster and report research  
C. Field trip reports
   
Writing Assignments  
A. Term paper outline and sources  
B. Term paper  
c. Small group reports
METHODS OF STUDENT EVALUATION:
- Midterm Exam
- Final Exam
- Written Assignments
- Essay Examinations
- Report
- Projects (ind/group)
- Problem Solving Exercises
- Oral Presentations
- Skills Demonstration

Demonstration of Critical Thinking:
- A. Matching geologic strata utilizing the ages of rocks, fossils present, and environment of formation.
- B. Compare and contrast land forms across the earth and draw a correlation between two different regions of the Earth.
- C. Utilize the fossils found in layers of rock to reconstruct the past climate and environment they were formed.

Required Writing, Problem Solving, Skills Demonstration:
- A. Term paper utilizing standard Geological Society of America format.
- B. Drawing geologic cross sections showing the historical ages of the rocks and how they relate across geographical region.

TEXTS, READINGS, AND RESOURCES:

TextBooks:

Manuals:

Periodicals:

LIBRARY:

Adequate library resources include: Print Materials
Non-Print Materials
Online Materials

Comments:
Students will use peer reviewed periodicals to write a research paper. The journals may be accessed as a hard print copy or from the online library database.

Additional class work may use Scientific American offprints such as the Evolution of Life Series.

Attachments:
- Attached Files